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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,966	10/02/2003	Chishio Koshimizu	7553.0019-01	6290

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EXAMINER

KACKAR, RAM N

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 03/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/675,966

Applicant(s)

KOSHIMIZU ET AL.

Examiner

Ram N Kackar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 13, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukamoto (US Patent No. 5,868,848) in view of Hirano et al (US Patent No. 5,411,624).

Tsukamoto teaches a plasma processing apparatus (Figs. 1, 4) that performs plasma processing on a workpiece W placed on an electrode 5 provided inside a processing chamber, comprising:

an electrically conductive ring body 71 (inner focus ring 71 made of conductive material) encompassing the periphery of the Wafer W placed on the electrode;

an electrically insulating ring body 72 (outer focus ring 72 made of quartz) encompassing the periphery of the electrically conductive ring body 71 (column 6, lines 31-60 and column 4, lines 5-11).

Tsukamoto fail to teach a thermal conductivity adjusting member provided between the electrode 5 and the electrically conductive ring body 71.

Hirano et al teach a plasma processing apparatus including a cathode ring 22 which may be an integral ring as shown in Fig. 9 or equivalently two separable rings 22 and 24 as shown in Fig. 1 wherein only the upper ring 24 is exposed to plasma and the inner ring 22 is protected against plasma environment (column 5, lines 53-61; column 8, lines 65-67; column 9, lines 31-45).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the inner focus ring 71 from two pieces as taught by Hirano et al as an art recognized equivalent for the same purpose with the advantage of exposing only the upper part of the ring to the plasma. See MPEP 2144.06, Art Recognized Equivalent for the Same Purpose, Substituting Equivalents Known for the Same Purpose (in re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982)).

Since ring 22 by its thermal properties inherently adjusts the thermal conductivity between ring 24 and the electrode it would be proper to call it a thermal adjusting member.

Further regarding claim 15: the thermal conductivity of the underneath ring would inherently follow the expression as recited in the claim.

Further regarding claim 16: as shown in Fig. 4 of Tsukamoto, the inner focus ring 71 is coupled to the electrode 5 using a screw (fastening member) 73. Utilization of a similar fastening member for coupling the underneath ring to the electrode is considered to have been obvious to one of ordinary skill at the time of the invention.

Claims 13, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukamoto (US Patent No. 5,868,848) in view of Rossman et al (US Patent No. 5,748,434).

Tsukamoto teaches a plasma processing apparatus (Figs. 1, 4) that performs plasma processing on a workpiece W placed on an electrode 5 provided inside a processing chamber, comprising:

an electrically conductive ring body 71 (inner focus ring 71 made of conductive material) encompassing the periphery of the Wafer W placed on the electrode;

an electrically insulating ring body 72 (outer focus ring 72 made of quartz) encompassing the periphery of the electrically conductive ring body 71 (column 6, lines 31-60 and column 4, lines 5-11).

Tsukamoto fail to teach a thermal conductivity adjusting member provided between the electrode 5 and the electrically conductive ring body 71.

Rossman et al teach a plasma processing apparatus including a shield 5 (Fig. 3) comprising a first shield member 60 positioned underneath a second shield member 62 and effectively isolated from each other so that the upper shield member may be heated to a higher temperature which increases the clean rate or deposition removal of the upper shield (column 4, line 51 through column 5, line 56).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the inner focus ring 71 from two pieces as taught by Rossman et al as so that the upper member can be heated to a higher temperature during a step of cleaning the focus ring.

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As in Hirano et al before, since ring 60 by its thermal properties inherently adjusts the thermal conductivity between ring 62 and the electrode it would be proper to call it a thermal adjusting member.

Further regarding claim 15: the thermal conductivity of the underneath ring would inherently follow the expression as recited in the claim.

Further regarding claim 16: as shown in Fig. 4 of Tsukamoto, the inner focus ring 71 is coupled to the electrode 5 using a screw (fastening member) 73. Utilization of a similar fastening member for coupling the underneath ring to the electrode is considered to have been obvious to one of ordinary skill at the time of the invention.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukamoto (US Patent No. 5,868,848) in view of Hirano et al (US Patent No. 5,411,624) or Rossman et al (US Patent No. 5,748,434) as applied to claims 13, 15 and 16 above, and further in view of Koshiishi et al (US Patent No. 5,919,332).

Tsukamoto in view of Hirano et al or Rossman et al teaches all limitations of the claims as discussed above except for a device for heat application to the electrically insulating ring body.

Koshiishi et al teach a plasma processing apparatus including an inner focus ring 61 (Fig. 17) and an outer focus ring 62 wherein the outer ring 62 having a conductive member 97 disposed therein for absorbing heat and heating the insulating member thereby to prevent reaction products from sticking to the insulating outer ring (column 16, lines 4-34; column 21, line 45 through column 23, line 64).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the mechanism for heating the insulating outer focus ring as taught by Koshiishi et al in the apparatus of Tsukamoto in view of Hirano et al or Rossman et al so that reaction products do not stick to the outer focus ring.

Response to Amendment

Applicant's arguments filed 12/21/2004 have been fully considered but they are not persuasive.

Applicant argues that no reference cited by the examiner discloses a thermal adjusting member.

This is not true since, absent any further limiting qualification of the thermal adjustment member, both Hirano et al and Rossman et al disclose a member between the conducting ring and the electrode which by its thermal properties inherently adjusts the thermal conductivity between the ring and the electrode it would be proper to call it a thermal adjusting member.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571 272 1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


RK

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